Eur J Vasc Endovasc Surg (2015) 49, 556–562

# Peripheral Artery Disease: A Marked Lack of Awareness in Ireland

**C.T. Cronin, D.P. McCartan, M. McMonagle, K.S. Cross, J.F. Dowdall** *

Department of Vascular Surgery, Waterford Regional Hospital, Dunmore Road, Ireland

**WHAT THIS PAPER ADDS**

This study found a profound lack of awareness of peripheral artery disease consistent with the findings of previous large international studies. It provides further evidence that focused awareness campaigns should address this paucity of knowledge to match patient and public knowledge of heart disease and stroke.

**Objectives:** Patients with symptomatic peripheral artery disease (PAD) have a 30% risk of death within 5 years. However, public awareness of vascular disease has been shown to be low. The aim of this study was to assess awareness regarding risk factors, significance and potential sequelae of PAD in an Irish population.

**Design:** A cross-sectional, anonymous survey of patients and members of the public.

**Materials:** An anonymous questionnaire was developed to collect details on basic demographics, presence of and treatment for risk factors for cardiovascular disease, awareness of PAD and its risk factors and sequelae. The local ethics committee granted ethical approval.

**Methods:** Two investigators in face-to-face interviews administered the survey with patients and members of the general public, older than 40 years of age, attending a range of outpatient clinics, day care services and in patients.

**Results:** A total of 336 questionnaires were administered. A post-secondary school course had been completed by 32% of respondents. Only 19% of patients reported familiarity with PAD, a figure considerably lower than those reporting familiarity with stroke (94%), coronary artery disease (78%) or diabetes (98%) (Chi Squared $p<0.001$). The only independent predictor of awareness of PAD was having a post-secondary school course with an odds ratio or 4.2.

**Conclusions:** This study demonstrates a disturbing lack of awareness of PAD and highlight the need for a meaningful targeted public health awareness campaign on PAD in order to close the gap of knowledge in Irish patients, prior to any prevention campaign.



Article history: Received 16 March 2014, Accepted 13 December 2014, Available online 28 February 2015

**Keywords:** Peripheral artery disease, Disease awareness

## INTRODUCTION

Atherothrombosis, which includes peripheral artery disease (PAD), coronary artery disease, and cerebral artery disease, is the number one cause of mortality in the world.[1,2] PAD is a recognized marker of generalized atherosclerosis. It is associated with significant overall mortality, 30% within 5 years and 50% at 10 years, primarily from myocardial infarction or stroke.[3–5] The 5-year survival probability for people with an ankle brachial index (ABI) less than 0.4 and critical ischaemia is only 56%.[6] This is less than patients who have suffered stroke (70%), coronary heart disease (79%), and some cancers such as breast cancer (85%).[7,8]

PAD, however, remains under-recognised, under-diagnosed, and undertreated. Approximately half of patients with PAD are asymptomatic, with typical symptoms present in only 20%.[9] This may contribute to its under-recognition in primary practice.

Despite the high prevalence and associated mortality risk with PAD,[7] no meaningful awareness campaign has been initiated in Ireland. Previous studies in North America and Holland have demonstrated poor public knowledge of PAD.[2,4,10,11] Initiatives such as the "Legs for Life" US screening programme have used a combination of risk assessment form and ABI to identify patients with PAD. This intervention by the Society of Interventional Radiology began in 1997 and was deemed successful in the short term, although no subsequent studies have been published to report longer-term outcomes such as mortality or rate of lower limb amputation.[13]

The aim of this study was to assess both awareness of and attitudes to PAD among a general population, including

DOI of original article: http://dx.doi.org/10.1016/j.ejvs.2015.01.015

* Corresponding author. J.F. Dowdall, Department of Vascular Surgery, Waterford Regional Hospital, Waterford, Ireland.

*E-mail address:* dowdallj@gmail.com (J.F. Dowdall).



http://dx.doi.org/10.1016/j.ejvs.2014.12.017

related terminology, identifiable risk factors, and potential sequelae of the disease.

## MATERIALS AND METHODS

This cross-sectional, tertiary hospital-based, descriptive study was conducted between December 1, 2012, and April 21, 2013. An anonymous questionnaire was designed which assessed basic demographics, the presence of risk factors and current treatment for cardiovascular disease and diabetes, self-reported knowledge of a range of diseases including PAD and other vascular and non-vascular diseases. The questionnaire is presented in full in the Electronic Supplementary Material, Fig. 1. Level of education completed was assessed based on whether or not a post-secondary-school degree or diploma course was completed.

Prior to commencing the study, a pilot trial of the questionnaire was performed on 20 individuals, after which only minor edits were required. The local ethics committee granted ethical approval for administration of the questionnaire and study.

The questionnaire was administered in hospital by two investigators (C.C., D.M.C.) in face-to-face interviews. Patients and members of the general public over 40 years of age were invited to participate in a range of settings including clinics in general/vascular surgery, nephrology and endocrinology, day care services and general surgery, and medical and orthopaedic inpatient wards. Members of the public who were accompanying patients at the same clinical settings, but were not attending hospital for their own benefit, were also invited. Two hundred and sixteen of the cohort were patients and 120 were members of the public. The purpose of the survey was verbally explained with a supporting pamphlet and informed consent was obtained from all those who agreed to participate. Only two people invited to participate refused to partake in the study. All participants completed the administered questionnaire process. Exclusion criteria included practising medical personnel and people under the age of 40.

Participants who were unfamiliar with the terms PAD were provided with an explanation as "disease of the arteries of the legs, a blockage or a narrowing of the arteries, affecting the circulation" before proceeding to subsequent questions. This confirmed an absence of awareness of PAD and was recorded as such on the questionnaire. Participant awareness at a minimal level was defined by participant familiarity with the term and knowledge of the organ it affected. For PAD we accepted participant awareness if they cited that it was a problem affecting either the "arteries" or the "circulation" of the legs.

Statistical analyses were carried out using MINITAB software. Data are reported as percentages. Chi-square tables were used for comparison of categorical data. The two-sample Student *t* test or the Mann—Whitney U test was used for continuous variables depending on data normality. Multivariate logistic regression analysis was used to ascertain independent predictors for an increased awareness of PAD. The variables included were age >60 years, level of post-secondary-school education, presence of diabetes, treatment for either hypertension or hypercholesterolaemia, sex, smoking status, and a history of treatment for stroke or myocardial infarction. Statistical significance was set at $p < .05$.

## RESULTS

A total of 336 surveys were administered during the study period to 165 (49%) men and 171 (51%) women, with 48% of participants aged over 60 (Table 1). Almost one-third of participants had completed a post-secondary-school course, diploma, or degree. The prevalence of smoking in respondents was 17%, with a further 40% reporting a past history of smoking.

Forty-one per cent reported receiving treatment for hypertension and 35% for hypercholesterolaemia. People treated for diabetes were over-represented, accounting for 20% of the study group. Thirteen per cent reported a past myocardial infarction and 8% reported a previous stroke.

Men had a higher prevalence of diabetes, past history of smoking, and treatment for previous cardiovascular disease (Table 2). There was an increased presence of all risk factors in patients over the age of 60. Respondents with a lower level of education had almost double the risk factors for hypertension, hypercholesterolaemia, and diabetes. One hundred and ten (32%) respondents reported current leg symptoms, including 39 (11%) describing frequent pain on walking and 21 (6.25%) reporting frequent pain when sitting.

The study population demonstrated a high awareness of stroke (94%), coronary artery disease (78%), diabetes (98%), and bowel cancer (86%) (Table 3). In contrast, only 19% self-reported awareness of PAD and 26% were aware of abdominal aortic aneurysm (AAA). Awareness of both PAD and AAA was greater in those with post-secondary-school education but no variation with age was noted. Although incidence of AAA is greater in men, in this population self-reported awareness of AAA was greater in women. There was no difference in rates of awareness of PAD in those who were current or ex-smokers when compared with those who had never smoked (17% vs. 22%, $p = .260$).

The majority of respondents (86%) correctly identified smoking as being high risk for development of PAD (Table 4). However, they similarly cited obesity (79%), lack of exercise (80%), and alcohol (68%) as high risk. Overall, 68% of respondents cited diabetes as a potential risk factor for PAD with a higher acknowledgement of diabetes as a risk factor by those with diabetes (82%) than those without (64%) ($p = .005$).

When questioned on the perceived consequences of PAD if not treated, similar to the responses for risk factors, there was little ability to differentiate the specific sequelae (chi square 2 × 6 table, $p = 1.000$) for PAD (Table 5). Amputation was recognized as a potential consequence by 60% of respondents, with those older than 60 years attributing a higher risk of PAD leading to all listed outcomes than younger respondents. Participants who felt themselves